

CLAIMS

1. Single step process for the preparation of lower α -alkene polymerisation heterogeneous solid catalyst comprising an organomagnesium precursor derived procatalyst comprising magnesium chloride supported titanium chloride and an internal electron donor and an organoaluminium compound based cocatalyst, wherein the mole ratio of aluminium in the cocatalyst to titanium in the procatalyst is 10 - 3000 : 1 and the procatalyst is obtained by single step reaction of organomagnesium precursor and titanium tetrahalide or titanium haloalkoxo species of the formula $Ti(OR)_m X_n$, wherein R is methyl, ethyl, normal or isopropyl, normal or isobutyl, preferably n-butyl, X is chlorine or bromine, preferably chlorine and $m + n = 4$ with the condition that when $m = 1 - 4$, $n = 3 - 0$ respectively with a hydrocarbon or halohydrocarbon solvent and internal electron donor and optionally an acid halide under microwave irradiation of 300 to 1200 W followed by isolating the procatalyst, the mole ratio of the organomagnesium precursor to the titanium tetrachloride or titanium haloalko species being 1: 6 to 1:20 and the mole ratios of the electron donor and acid halide to titanium being 0.3 to 1.5 and 0.02 to 0.2, respectively.

2. Single step process as claimed in claim 1, wherein the organomagnesium precursor is magnesium ethoxide.

5 3. Single step process as claimed in claim 1, wherein the mole ratio of the organomagnesium precursor to the titanium tetrachloride or titanium haloalkoxo species is 1:13.

10 4. Single step process as claimed in claim 1, wherein the titanium tetrahalide is titanium tetrachloride.

5. Single step process as claimed in claim 1, wherein the mole ratio of aluminium in the cocatalyst to titanium in the procatalyst is 200 : 1.

15 6. Single step process as claimed in claim 1, wherein the solvent is chlorobenzene.

7. Single step process as claimed in claim 1, wherein the microwave radiation of 300 W is applied.

8. Single step process as claimed in claim 1, wherein the organoaluminium compound is triethyl aluminium.

9. Single step process as claimed in claim 1, wherein the molar ratios of the electron donor and acid halide, if any, to titanium are 0.7 and 0.07 respectively.

10. Single step process as claimed in claim 1, wherein the electron donor is ethyl benzoate, dibutyl or diisobutyl phthalate.

11. Single step process as claimed in claim 1, wherein the acid halide is benzoyl chloride.

12. Lower α -alkene polymerisation heterogeneous solid catalyst obtained by the single step process as claimed in any one of claims 1 to 11.

13. Single step process for the preparation of polypropylene polymerisation heterogeneous solid catalyst comprising an organomagnesium precursor derived procatalyst comprising magnesium

chloride supported titanium chloride and an internal electron donor and an organoaluminium compound based cocatalyst and a selectivity control agent, wherein the mole ratio of aluminium in the cocatalyst to titanium in the procatalyst is 10 - 3000 : 1 and the mole ratio of selectivity control agent to titanium is 10 - 100 : 1 and the procatalyst is obtained by single step reaction of organomagnesium precursor and titanium tetrahalide or titanium haloalkoxo species of the formula $Ti(OR)_m X_n$, wherein R is methyl, ethyl, normal or isopropyl, normal or isobutyl, preferably n-butyl, X is chlorine or bromine, preferably chlorine, $m = 0$ and $n = 4$ with a hydrocarbon or haloalkohydrocarbon solvent and an internal electron donor and optionally an acid halide under microwave irradiation of 300 to 1200 W followed by isolating the procatalyst, the mole ratio of the organomagnesium precursor to the titanium tetrachloride or titanium haloalko species being 1: 6 to 1:20 and the mole ratios of the electron donor and acid halide to titanium being 0.3 to 1.5 and 0.02 to 0.2 respectively.

14. Single step process as claimed in claim 13, wherein the organomagnesium precursor is magnesium ethoxide.

15. Single step process as claimed in claim 13, wherein the mole ratio of the organomagnesium precursor to the titanium tetrachloride or titanium haloalkoxo species is 1:13.

5 16. Single step process as claimed in claim 13, wherein the titanium tetrahalide is titanium tetrachloride.

17. Single step process as claimed in claim 13, wherein the mole ratio of aluminium in the cocatalyst to titanium in the procatalyst is 200 : 1.

10 18. Single step process as claimed in claim 13, wherein the solvent is chlorobenzene.

19. Single step process as claimed in claim 13, wherein the microwave
15 radiation of 300 W is applied.

20. Single step process as claimed in claim 13, wherein the organoaluminium compound is triethyl aluminium.

21. Single step process as claimed in claim 13, wherein the selectivity control agent is p-ethoxy ethyl benzoate or dicyclohexyl dimethoxy silane or diphenyl dimethoxy silane.

5 22. Single step process as claimed in claimed 13, wherein the mole ratio of the selectivity control agent to titanium is 10 - 75 : 1.

23. Single step process as claimed in claim 13, wherein the molar ratios of electron donor and acid halide, if any to titanium are 0.7 and 0.07,
10 respectively.

24. Single step process as claimed in claim 13, wherein the electron donor is ethyl benzoate, dibutyl or diisobutyl phthalate.

15 25. Single step process as claimed in claim 13, wherein the acid halide is benzoyl chloride.

26. Lower α -alkene polymerisation heterogeneous solid catalyst obtained by the single step process as claimed in anyone of claims 13 to

20 25.

27. A process for polymerisation of lower α -alkene with a heterogeneous solid catalyst as claimed in claim 12 or 26 under polymerisation conditions in known manner.